

What is claimed is:

1. An article of manufacture, comprising:

a fiber material in an amount of about 40% to about 70% by weight and a thermal plastic material in an amount of about 30% to about 60% by weight.
2. An article of manufacture according to claim 1 wherein the fiber material is selected from the group consisting of agricultural by-products, industrial by-products, fiberglass and wood.
3. An article of manufacture according to claim 2 wherein the fiber material is an agricultural by-product selected from the group consisting of corn stalks, wheat straw, bamboo reeds, and sisal.
4. An article of manufacture according to claim 1 wherein the fiber material is wood.
5. An article of manufacture according to claim 2 wherein the fiber material is fiberglass.
6. An article of manufacture according to claim 4 wherein the wood is of a size which fits through a 20 to 50 mesh screen and weighs about 13 to about 15 pounds per cubic foot.
7. An article of manufacture according to claim 6 wherein the wood fits through a 40 mesh screen.

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8. An article of manufacture according to claim 1 wherein the fiber material is in an amount about 60% by weight, and the thermal plastic is in an amount about 40% by weight.
9. An article of manufacture according to claim 1 wherein the thermal plastic material is polyethylene or polypropylene.
10. An article of manufacture according to claim 9 wherein the thermal plastic material is polypropylene.
11. An article of manufacture according to claim 10 wherein the thermal plastic has a MFI (Melt Flow Index) of about 8 to about 15.
12. An article of manufacture according to claim 1 further comprising at least one enhancer selected from the group consisting of stearic acid, benzl peroxide, dichloro-s-triazine, isocyanates, and maleic anhydride in an amount of about 3% by weight.
13. An article of manufacture according to claim 12 wherein the enhancer is maleic anhydride.
14. An article of manufacture according to claim 1 further comprising at least one additive selected from the group consisting of dyes, ultraviolet protecting additives, flame retardants, fungus retardants, heat resistant antioxidants, and insect retarding additives.

15. An article of manufacture according to claim 14 further comprising at least one of the following additives:

about .02% to about 2% of dye coloring;

about .02% to about 1% of fire retardation additive;

about .12% to about 1% ultraviolet protection additive;

about .12% to about 1% of insect resistance additives; and

about .5% heat resistant antioxidants.

16. An article of manufacture according to claim 1 further comprising a film or veil on a surface of the article of manufacture providing additional durability or UV resistance to the surface of the article of manufacture.

17. An article of manufacture according to claim 16 wherein the film or veil is made from a material selected from the group consisting of polypropylene, polyethylene, and polyester.

18. An article of manufacture according to claim 1 wherein the article of manufacture is a building board or building panel.

19. A process for forming a composite article of manufacture comprising:

a) adding fibers screened through a 20-40 mesh to a mixing container;

- b) heating the fibers in step(a) to remove moisture;
 - c) contacting a hot thermal plastic with the fibers of step (b) to produce a fiber/thermal plastic composite; and
 - d) contacting the fiber/thermal plastic mixture of step (c) with a die to provide shape to the fiber/thermal plastic composite and to produce the composite article of manufacture.
20. A process for forming a composite article of manufacture according to claim 19 wherein the fibers are added to the mixing container by a gravimetric feeder so as to provide a consistent feed of fiber to the mixing container.
21. A process for forming a composite article of manufacture according to claim 19 wherein the mixing container is a twin screw extruder.
22. A process for forming a composite article of manufacture according to claim 19 wherein the fibers are heated to remove moisture.
23. A process for forming a composite article of manufacture according to claim 19 further comprising subjecting the fibers to a vacuum to remove additional water from the fibers.
24. A process for forming a composite article of manufacture according to claim 19 wherein the fibers are heated to a constant temperature of about 400 degrees F to about 450 degrees F.

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25. A process for forming a composite article of manufacture according to claim 24 wherein the fibers are heated to about 425 degrees F.
26. A process for forming a composite article of manufacture according to claim 19 further comprising adding at least one additive selected from the group consisting of dyes, ultraviolet light protecting additives, flame retardants, fungus retardants additives, heat resistance antioxidants, and insect retarding additives to the hot thermal plastic of step (b) to produce a hot thermal plastic additive mixture that is contacted with the fibers of step (c).
27. A process for forming a composite article of manufacture according to claim 19 wherein the hot thermal plastic is contacted with the fibers by injecting the hot thermal plastic into the mixing container containing the fibers.
28. A process for forming a composite article of manufacture according to claim 19 further comprising cooling the composite article of manufacture once the composite article of manufacture is shaped.
29. A process for forming a composite article of manufacture according to claim 28 wherein the composite article of manufacture is first cooled to about 200 degrees F and then subsequently cooled to room temperature.
30. A process for forming a composite article of manufacture according to claim 29 wherein the composite article of manufacture is cooled using a water spray system that sprays water on each surface of the composite article of manufacture.

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31. A process for forming a composite article of manufacture according to claim 28
further comprising cutting the cooled composite article of manufacture to produce
composite articles of manufacture of desired lengths.
32. A process for forming a composite article of manufacture according to claim 19
wherein the fiber is an agricultural by-product.
33. A process for forming a composite article of manufacture according to claim 32
wherein the agricultural by-product is selected from the group consisting of corn
stalks, wheat straw, bambu reeds, and sisal.
34. A process for forming a composite article of manufacture according to claim 19
wherein the fiber is wood or crumb rubber.
35. A process for forming a composite article of manufacture according to claim 19
wherein the thermal plastic is selected from the group consisting of polyethylene
and polypropylene and a combination thereof.
36. A process for forming a composite article of manufacture according to claim 26
wherein the additive added to the composite article of manufacture is maleic
anhydride.
37. A process for forming a composite article of manufacture according to claim 26
wherein the composite article of manufacture produced is a building board or
building panel.

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38. A process for forming a composite article of manufacture according to claim 36 wherein between about .5% to about 3% of maleic anhydride is added to the composite article of manufacture.
39. An article of manufacture according to claim 1 wherein the article of manufacture has a flex modulus of about 1.2 to about 1.3 Million.
40. An article of manufacture according to claim 8 wherein the fiber material is about 57% by weight and the thermal plastic is about 38% by weight.
41. An article of manufacture according to claim 1 wherein the article of manufacture comprises about 35% by weight of fiberglass, 25% by weight of wood fiber, and about 40% by weight of thermal plastic material.
42. An article of manufacture according to claim 1 wherein the fiber material is a mixture of fiberglass and wood.
43. An article of manufacture according to claim 42 wherein the fiber material is fiberglass.
44. An article of manufacture according to claim 42 wherein the article of manufacture comprises about 60% by weight of fiberglass and 40% by weight of thermal plastic material.
45. A process for forming a composite article of manufacture according to claim 19 wherein the fibers comprise a mixture of fiberglass and wood.

46. A process for forming a composite article of manufacture according to claim 45 wherein the fiber is fiberglass.
47. An article of manufacture according to claim 5 wherein the fiberglass is in the form of chop and is about $\frac{1}{4}$ inch to about 1 inch in length.
48. A process for forming a composite article of manufacture comprising:
- a) adding fiberglass chop about $\frac{1}{4}$ inch to about 1 inch in length to a mixing container;
 - b) heating the fibers in step (a) to remove moisture;
 - c) contacting a hot thermal plastic with the fibers of step (b) to produce a fiber/thermal plastic composite; and
 - d) contacting the fiberglass/thermal plastic mixture of step (c) with a die to provide shape to the fiberglass/thermal plastic composite and to produce the composite article of manufacture.

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49. A process for forming a composite article of manufacture according to claim 48 wherein the fibers are added to the mixing container by a gravimetric feeder so as to provide a consistent feed of fiber to the mixing container.
50. A process for forming a composite article of manufacture according to claim 48 wherein the mixing container is a twin screw extruder.
51. A process for forming a composite article of manufacture according to claim 48 further comprising subjecting the fibers to a vacuum to remove additional water from the fibers.
52. A process for forming a composite article of manufacture according to claim 48 wherein the fibers are heated to a constant temperature of about 400 degrees F to about 450 degrees F.
53. A process for forming a composite article of manufacture according to claim 48 further comprising adding at least one additive selected from the group consisting of dyes, ultraviolet light protecting additives, flame retardants, fungus retardants additives, heat resistance antioxidants, and insect retarding additives to the hot thermal plastic of step (b) to produce a hot thermal plastic additive mixture that is contacted with the fibers of step (c).
54. A process for forming a composite article of manufacture according to claim 48 wherein the hot thermal plastic is contacted with the fibers by injecting the hot thermal plastic into the mixing container containing the fibers.

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55. A process for forming a composite article of manufacture according to claim 48 further comprising cooling the composite article of manufacture once the composite article of manufacture is shaped.
56. A process for forming a composite article of manufacture according to claim 48 wherein the composite article of manufacture is first cooled to about 200 degrees F and then subsequently cooled to room temperature.
57. A process for forming a composite article of manufacture according to claim 48 wherein the composite article of manufacture is cooled using a water spray system that sprays water on each surface of the composite article of manufacture.
58. A process for forming a composite article of manufacture according to claim 48 further comprising cutting the cooled composite article of manufacture to produce composite articles of manufacture of desired lengths.
59. An article of manufacture according to claim 1 wherein the fiber used is fiberglass and the article of manufacture has a flex modulus up to about 2.0 Million.
60. An article of manufacture according to claim 1 comprising about 25% to about 60% by weight of fiberglass, 25% to about 40% wood, and about 40% to about 70% weight of plastic.